Response of a native grassland in the Falkland Islands to liquid seaweed extract

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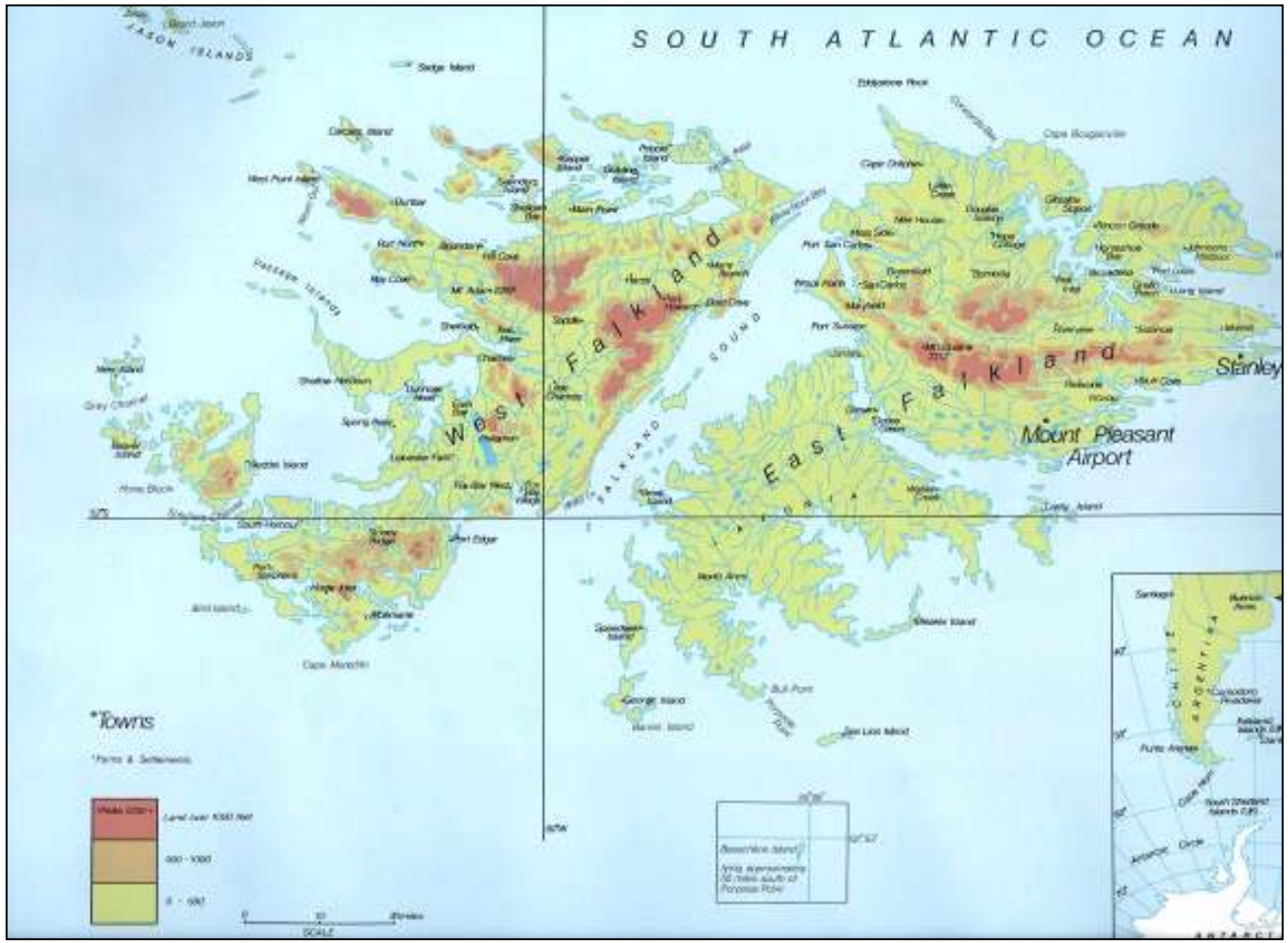
Canada
United States
of America
Brazil
Chile
Argentina
Falkland
Islands


SOUTH ATLANTIC OCEAN
JASON ISLANDS
Sedge Island
Passage Islands
West Falkland
East Falkland
Falkland Sound
Stanley
Mount Pleasant Airport
Towns
Cape Meredith
George Island
Bull Point
Jason Islands
ARGENTINA
ANTARCTIC

The Falkland Islands

(Area: 1.2 million ha ; POP = 2.500)

◆**Climate :** Maritime, Cool, Windy and Dry

(Mean Summer 9^{o}C ; Winter 2^{o}C ; 600mm rain).

◆**Soils :** Acid (pH 4-4.5); infertile peats low N and P status.

◆**Vegetation :** Dwarf shrub heath and tussock -grassland.

◆**Agriculture :** Extensive sheep farming for wool.

Problems

- Total reliance on one product.
- Low wool prices.
- Fragile rural economy infrastructure.
- Limited opportunities for diversification.
- Decline in rural population.

Possible solutions

- Seek niche market products.
- Diversify production.
- Exploit “Clean green” image.
- Organic status.
- Move from sheep to cattle.

Increased output of “organic” quality meat or other products will require

- Shelter.
- Improved, legume-based pasture.
- Improved quality of native grassland
- Fodder crops to fatten stock.

THE KEY TO THESE WILL BE IMPROVED SOIL FERTILITY AND ANIMAL NUTRITION

Soil Fertility

- No indigenous fertiliser sources
- Some deposits of Calcified seaweed
- Huge resources of kelp around the Islands - mainly *Macrocystis pyrifera,* but also *Lessonia flavicans*, *L. nigrescens* & *L. frutescens*.
- Estimated sustainable yield (Kelco, 1973) - 80,000 dry tonnes/year.

Key Issues

◆Reseeding has been attempted and experiments have indicated a response to liquid Seaweed Extract (See poster by McAdam & Kerr-EPC3).

◆The Islands are seeking full organic status.

◆There is a need to improve the low productivity and quality of the extensive native, whitegrass dominant pasture.

◆The only feasible local source of fertiliser is kelp (*Macrocystis* or *Lessonia Durvillaea* species).

Field Trial-1

Liquid seaweed extract was prepared by macerating and composting kelp (*Macrocystis pyrifera*)

Element	Level
Carbon (%)	62.1
Nitrogen (%)	1.79
C:N ratio	34.7
Potassium (%)	3.3
Phosphorous (%)	1.5
Magnesium (%)	0.4
Chlorine (%)	3.1
Calcium (%)	1.4
Cobalt ppm	<3.0
Copper ppm	7.9
Iodine ppm	1000

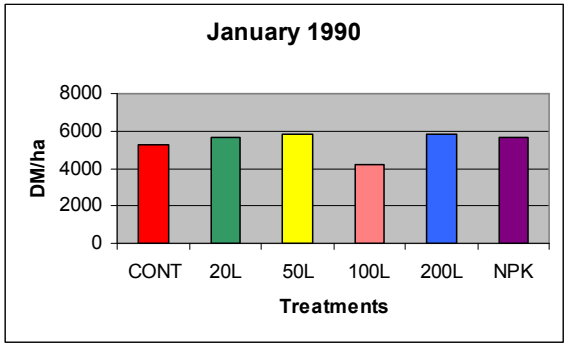
LSE was applied in spring at rates of 0, 20, 50, 100 and 200 litres/ha (in water) and Nitrochalk (25%N) applied at 60 kg Nha-1 in 2m x 2m plots (4 reps) in uniform whitegrass-dominant pasture

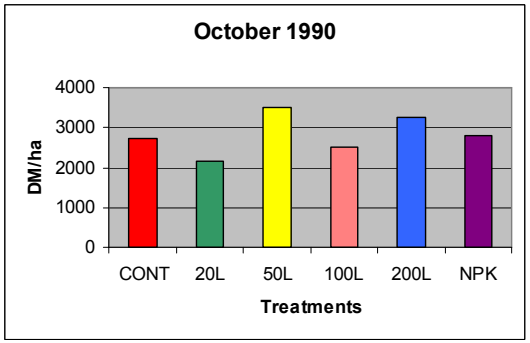
Measurements

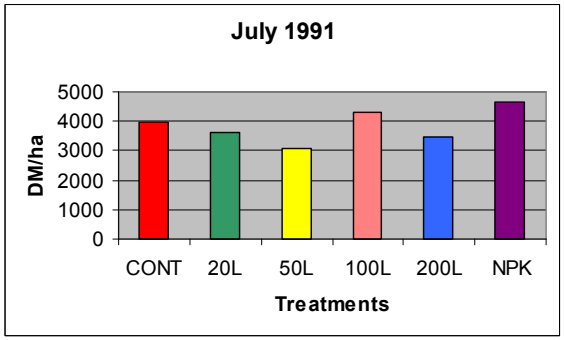
Measurements	Treatment Applied			
	Year 1	Year 2	Year 3	Year 4
Biomass	x2	x2	x2	x2
Nutrients in Herbage		*		
Biodiversity			*	

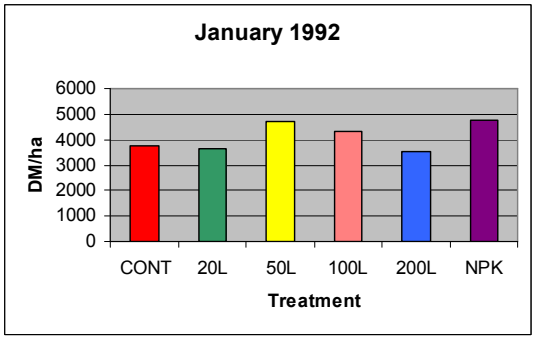
Results

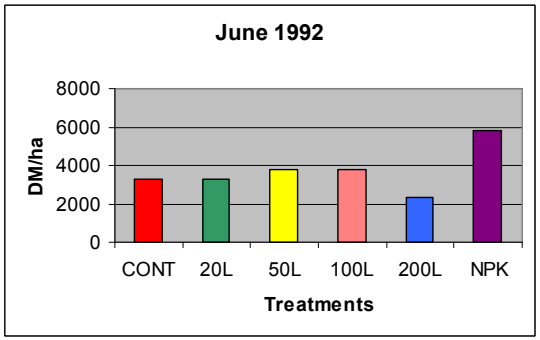
Pasture Production

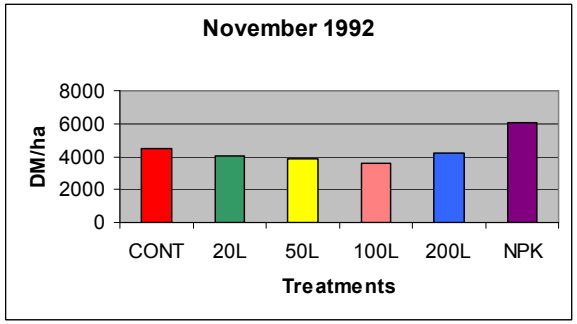


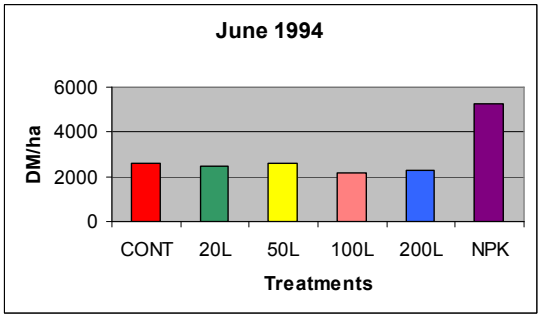




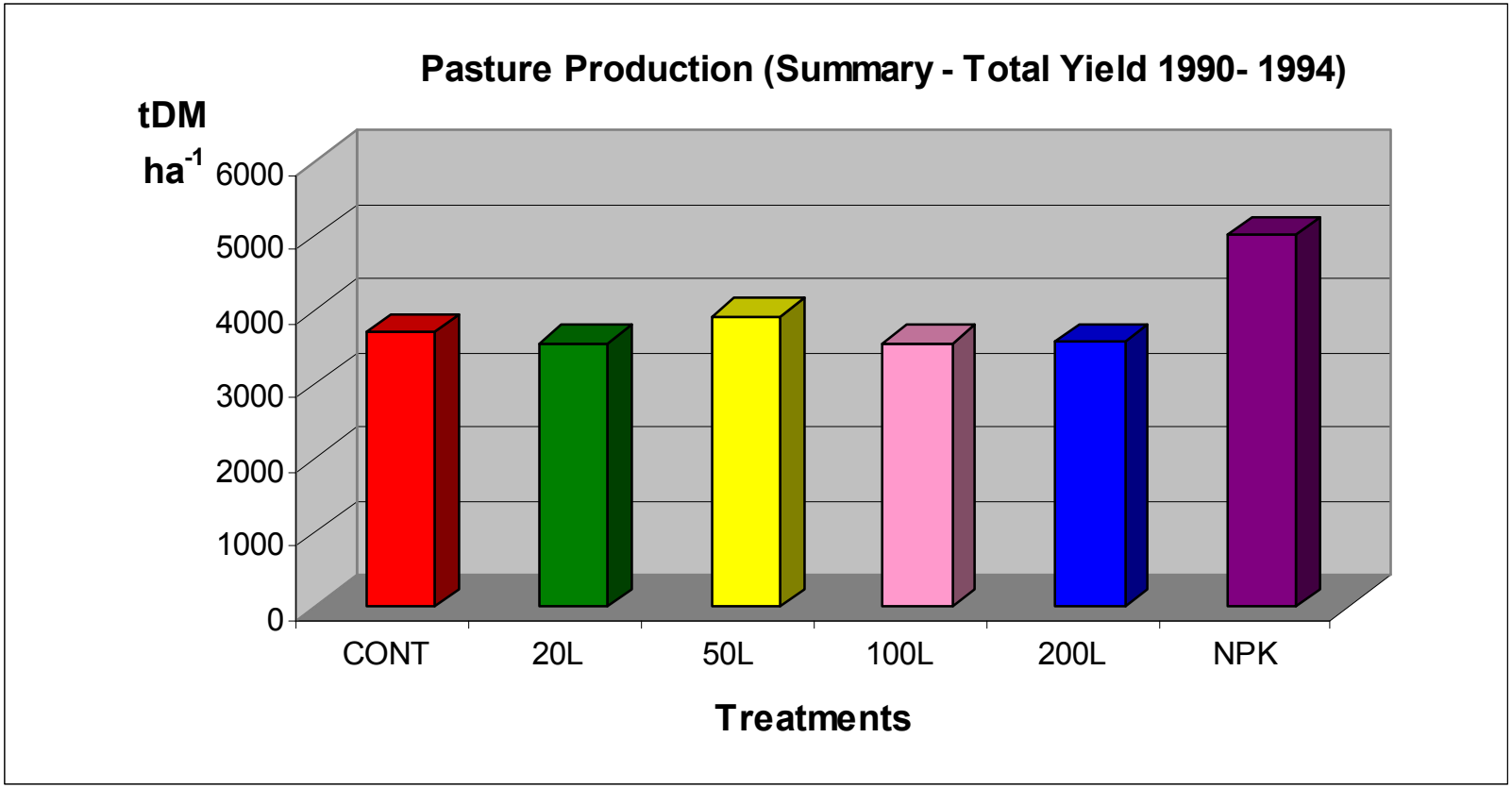








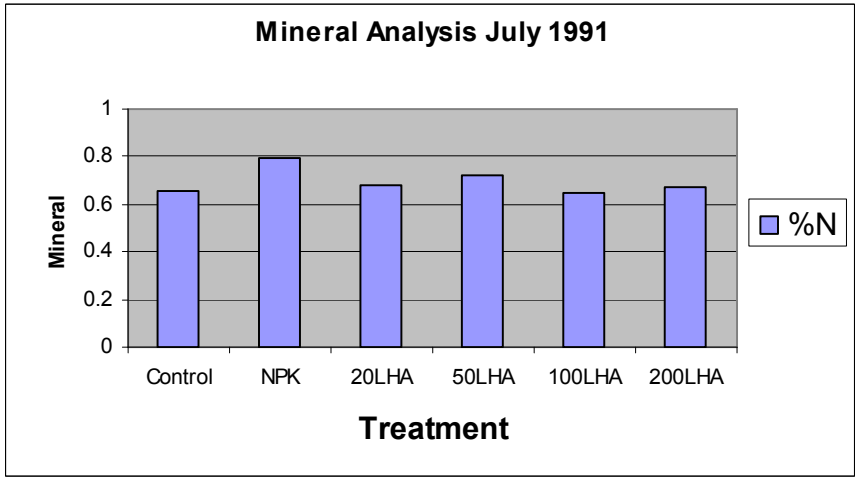
Positive response to higher levels of LSE by year 4.

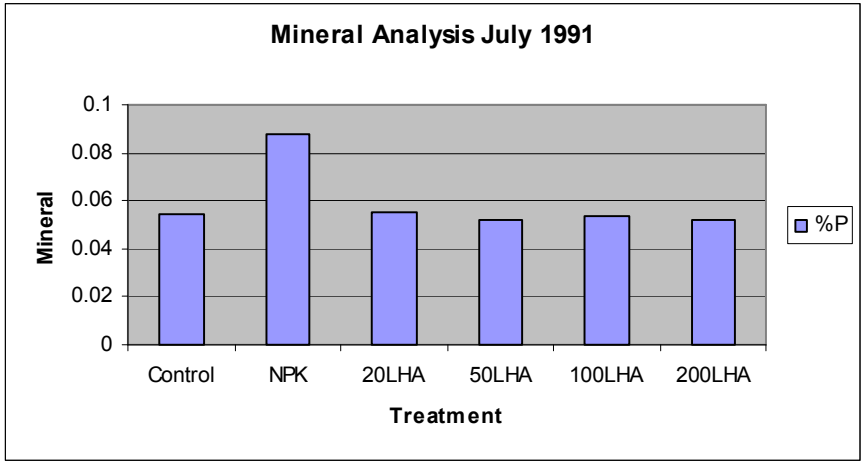


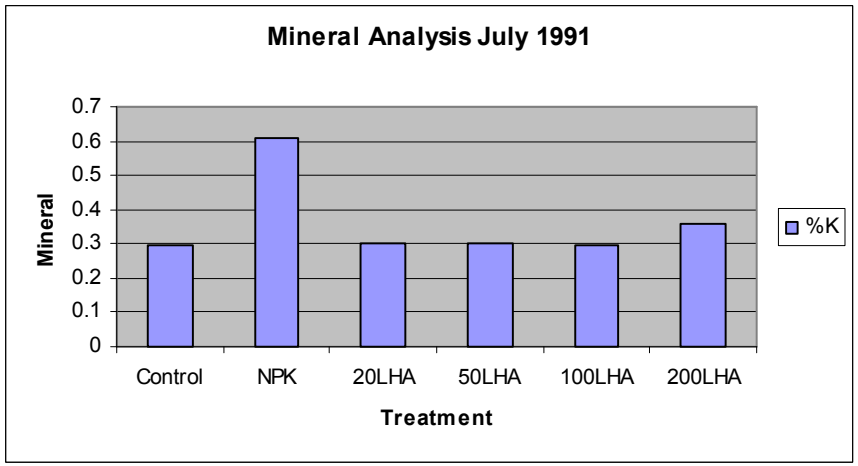
Overall Response

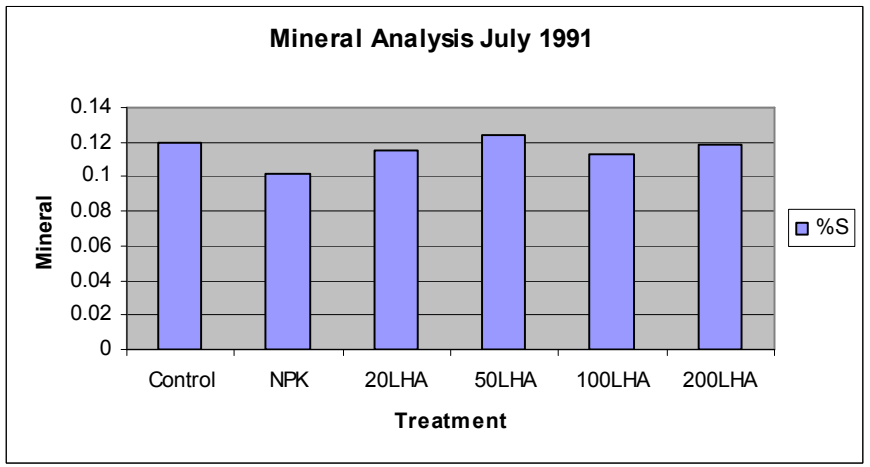
Herbage Nutrient Levels

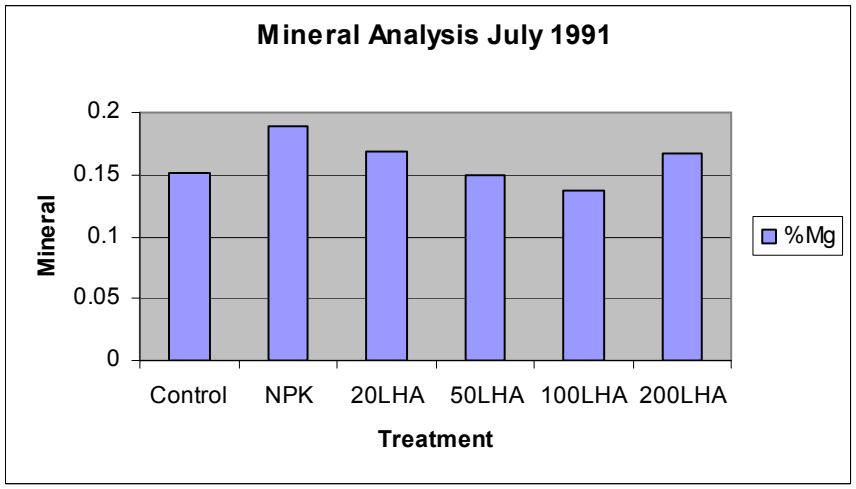
N & P contents of herbage higher from Nitrochalk than LSE.

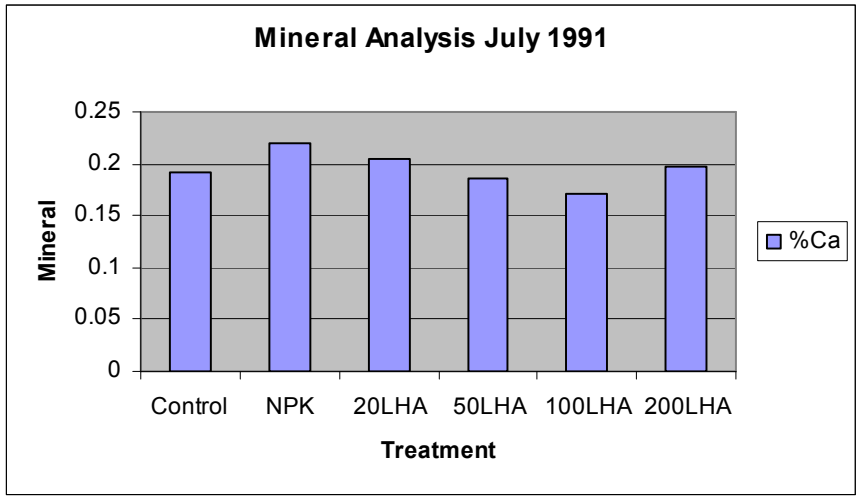






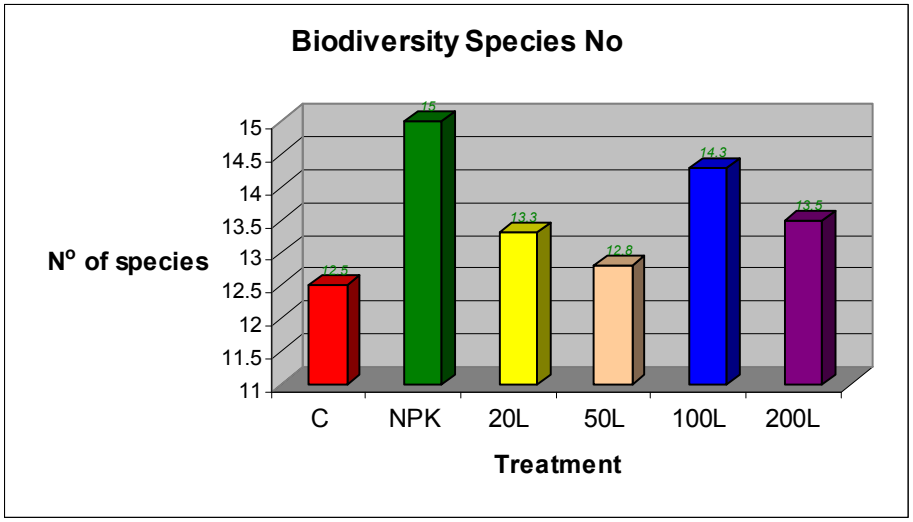


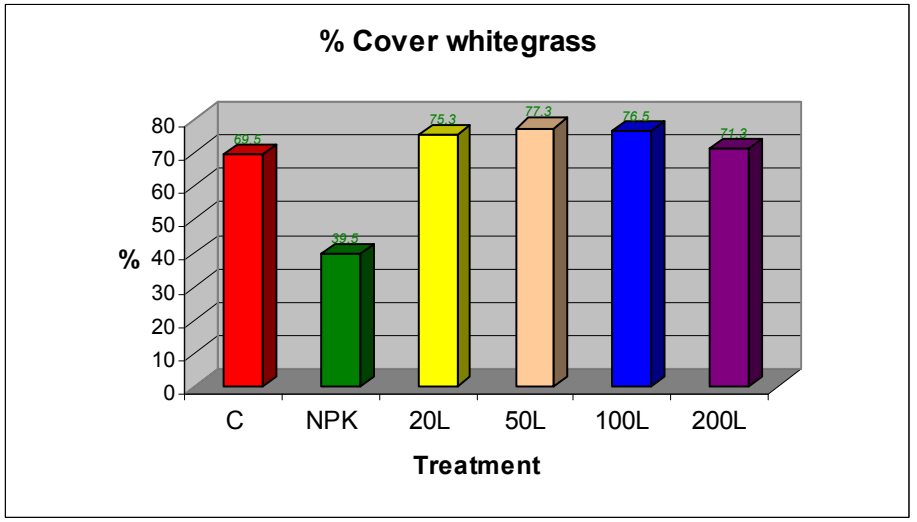


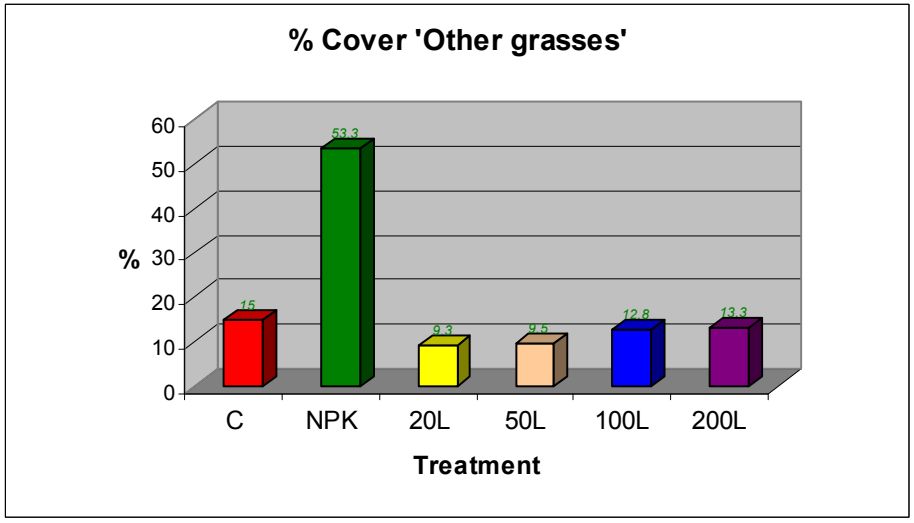


- ✓ N, P & K contents of herbage higher from Nitrochalk than LSE
- ✓ Mg & S not significantly lower in LSE than Nitrochalk treatments

Sward Biodiversity







Species biodiversity greatest with Nitrochalk.

Conclusions

◆Response to LSE will be slow but perhaps inherent changes in soil fertility are slowly occurring

◆Pasture composition less changed with LSE than with Nitrochalk (good or bad?)

◆Responses generally much slower and lower to native pasture than to reseed.

◆However LSE has the potential to increase growth and quality of native pasture in organic systems

◆This could be important in developing sustainable land use systems in the Falkland Islands.